

The Executive Computer/John Markoff

Curtain's Rising on a Third Generation of On-Line Services

The Internet is going commercial with new hookups for PC's.

INDIAN WELLS, Calif.

THE fashionable joke floating around the Internet last week was that the "information superhighway is just like CB radio, but with more typing."

There is no disputing that computer networks and on-line services — spurred on in part by Vice President Al Gore and his promotion of the "national information infrastructure" — are currently the nation's biggest craze.

At Demo 94, a personal computer industry conference held here each year, a new generation of on-line services was on exhibit last week. The offerings won't be commercially available until later this year, but many of the technologies have already emerged in experimental form on the Internet, the global network of networks used by more than 15 million people.

And last week there were also fresh indications that the Internet is gaining commercial momentum, as major publishers begin to offer genuine commercial services over the net.

The first generation of on-line services, which emerged in the late 1970's, were based on connecting one's

"dumb" terminal — a personal computer using terminal-emulator software — to a mainframe computer. Problems included a slow response time and a monitor display limited to simple screens of text.

The second generation — services like those from the Prodigy Services Company and America On-Line — have used the increasing power of the personal computer to speed up the interaction and give a simpler and more graphical interface to the user.

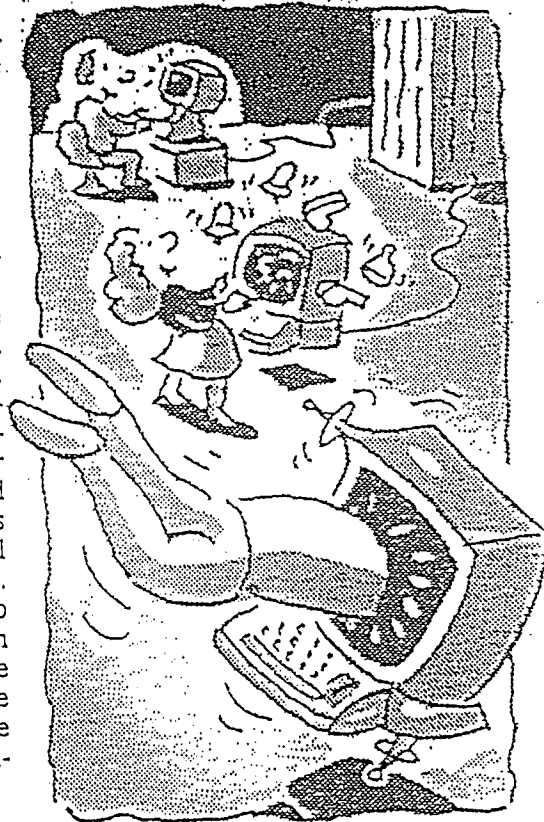
The next generation of on-line technology, exemplified by the new Interchange service that the computer trade publisher Ziff-Davis announced last week, is starting to emerge as computers grow even more powerful and communications links get faster.

The new systems promise to change the way users interact with remote central computers and, more significantly, are for the first time beginning to hint at an experience that rivals traditional print publishing.

"This is truly the third generation in on-line technology," said Stewart Alsop, editor of Infoworld, a rival personal computer newspaper that has agreed to be distributed over the new Ziff-Davis service. "It begins to remove the notion of remoteness that came with earlier services."

Indeed, the old mainframe-to-dumb-terminal model of tele-computing appears to be giving way rapidly.

Earlier this month, General Magic, a Mountain View, Calif., software developer, unveiled Telescript, a com-



Gary Zaimchick

munications language that will provide the foundation of A.T.&T.'s Personal Link on-line service, scheduled to begin later this year.

With Telescript, a computer user has no idea of "connecting" to a remote service at all. Instead, a program called an agent travels from the user's computer through the network, looking for information or even making purchases, based on commands given by the user.

Ziff-Davis is the largest publisher of computer magazines, and the In-

terchange service, which will be commercially available for Windows-based personal computers in the fall, offers its readers a way to read their favorite publications on-line, as well as the ability to join communities of other personal computer enthusiasts and download software and other information.

By itself that doesn't appear to be any more than what is available on existing on-line services, including Ziff-Davis's own Ziffnet, which is accessible through Compuserve.

But the Interchange system moves a step forward in taking advantage of the client personal computer. It offers the ability to view true "compound" documents that include graphics and images, rather than simple windows of scrolling text. It also offers multi-tasking, which means that you can start to download a document or a program in one part of the system and then go on to browse information in another part while the download is taking place, unattended.

Interchange, scheduled to go on-line next fall, makes extensive use of "hyper text" links between different pieces of information — a feature that is widely accessible in the Internet, but not available in more tightly compartmentalized commercial systems. As Interchange is designed, this means that it is possible to read a news article about a new computer system and then click on a pointer to read reviews about the same machine that are stored elsewhere.

No pricing information was available for Interchange, but the service

will be sold via a fixed monthly membership fee for a specific number of hours, with additional hours sold on a metered basis.

The idea, said Michael Kolowich, president of Ziff-Davis Interactive, is to avoid the high costs that Prodigy encountered when it found that the service it envisioned as shopping in an electronic information-retrieval mall instead turned into an electronic community center where users chatted on-line for hours and hours, paying only a monthly flat fee. Prodigy subsequently changed to a pricing system pegged more closely to actual on-line time.

"You don't want to get into the trap that Prodigy got in when their best customers became their worst customers," Mr. Kolowich said.

Another intriguing commercial venture introduced at Demo 94 was a joint venture between Dow Jones's electronic Dowvision news service and Wais Inc., a small software and services company.

Dowvision, which includes The Wall Street Journal and a variety of other newspapers and financial information, will be made available through Wais via the Internet for a monthly license or subscription fee. Next year, the service will also include The New York Times News Service, under an agreement signed last month by The New York Times Company and Dow Jones.

The Wais version of Dowvision should be a good example of third-generation on-line service. Users won't log in to Dow Jones at all. Instead they will be able to use a variety of "client" programs on their personal computers to more easily browse through and retrieve specific

information from the Dowvision database.

These client programs, which include Wais's own, as well as two free public-domain programs known as Gopher and Mosaic, display information in windows on an Apple Macintosh or on a Windows-based personal computer. The software eliminates many steps for the user, making many disparate data bases seem to be a single information bank. Retrieving specific stories is done by pointing with the mouse and clicking on a particular headline.

Dow Jones officials said the Wais joint venture is an experiment with electronic distribution over the Internet. For example, in a manner similar to the way newsstands work today, it will be possible to make the headlines of the day's top stories available for free for anyone on the Internet to browse. People who wanted to read the article, however, would have to pay for the "publication."

"We're looking at this as a way to learn about the Internet," said Greg Gerdy, assistant director of Dowvision. "The Internet is still the wild wild West."

The big question, of course, is one the publishing world hasn't answered yet: Will electronic news services steal subscribers from traditional print publications?

Ziff-Davis executives said they hoped theirs would represent an obvious synergy between print publications and on-line services. "There are some things that print does well and some things that electronic media do better," said Mr. Kolowich of Ziff-Davis. "But we expect our print publications to be around for a long, long time."

Britannica's 44 Million Words Are Going On Line

By JOHN MARKOFF

Special to The New York Times

SAN FRANCISCO, Feb. 7. — Encyclopedia Britannica, the publisher of the nation's oldest and most prestigious reference work, said today that it would enter the information age by offering electronic distribution of its materials to universities and some public libraries via the Internet, the world's largest computer network.

The development is one of the clearest indications that traditional publishers realize the limitations of offering only hard-bound volumes — and are concluding that the opportunities of on-line publishing outweigh the risks.

"Companies in the electronic publishing market are beginning to see they want the largest possible market," said Christopher Locke, general manager of Mecklermedia, a Westport, Conn., publishing and exhibition company. "They don't want to be trapped in markets that are Balkanized or private."

Several encyclopedias are already available on line, but the Encyclopedia Britannica is the largest, with worldwide revenues of \$550 million a year.

Electronic Bookshelves

Encyclopedias available through on-line computer networks or the type of compact disks known as CD-ROM's



Encyclopedia	Publisher	Network	CD-ROM
Compton's Interactive Encyclopedia	Compton's New Media	Prodigy, America Online	Yes
Encarta	Microsoft	None	Yes
Encyclopedia Britannica	Encyclopedia Britannica North America	Internet	Yes
Grolier Academic American	Grolier Electronic Publishing	America Online, CompuServe	Yes

It also represents a significant move toward instant information and a milestone in miniaturization for the 32-volume reference work, which contains 44 million words and 23,000 illustrations and adorns the bookshelves of millions of libraries and homes.

"This is a blessing for every school

kid," said Paul Saffo, a researcher at the Institute for the Future in Menlo Park, Calif. "We've all been there before, the night before we have a paper due in class."

The 225-year-old Encyclopedia Britannica, which is the oldest continuously published encyclopedia in the

English language, will be made available initially to university faculty and students beginning in the fall using a variety of information-retrieval technologies that have been developed experimentally by Internet researchers and that are being quickly commercialized.

Encyclopedia Britannica executives said they were also planning to make their reference data base available to a larger commercial audience, but academic distribution would be a first step to insure that the electronic version of the encyclopedia was well tested.

"The whole development process has been an astonishing one for me," said Robert McHenry, editor in chief of the Britannica. "I've scrambled pretty hard just to keep up with the technical language."

The electronic version of the Encyclopedia Britannica, to be called Britannica Online, is now being tested by students and faculty at the University of California at San Diego. The on-line version includes "hypertext" links that cannot be matched by the traditional text version.

This technology makes it possible

Continued on Page C2

Britannica's Words Go On Line on the Internet

Continued From First Business Page

for each article in the encyclopedia to refer to other related works and illustrations. It also seamlessly links together the four components of the encyclopedia: the macropedia, which is the extended version; the micropedia, which is the condensed version; the index, and a broad outline of world knowledge called the propedia.

To organize the more than 300 million characters of text and 2,000 illustrations, the Encyclopedia Britannica is using information retrieval software developed by WAIS Inc., a Menlo Park, Calif., software developer.

To search the electronic version, students will use networked personal computers and work stations running a program known as Mosaic, developed at the National Center for Supercomputer Applications at the University of Illinois at Champaign-Urbana. The software displays documents and illustrations and highlights words and phrases that have links to other documents. By clicking on a highlighted block of text or illustration, it is possible to retrieve a related document automatically from the Encyclopedia Britannica database.

Encyclopedia Britannica executives said they would probably price the encyclopedia to universities on a subscription basis, depending on the number of students on campus. However, they said they were still considering a variety of pricing methods for general commercial distribution.

One possible plan may be to charge on a reference-by-reference basis. That is made possible by the WAIS and Mosaic software. Currently, on-line encyclopedias are provided as standard service by on-line publishers like Compuserve, America Online and Prodigy.

Encyclopedia Britannica executives said they had decided to become electronic publishers rather than allying themselves with an existing on-line service because of the economics.

"The main reason we're doing it ourselves is that you just can't make any money licensing your content," said Joseph J. Esposito, president of Encyclopedia Britannica North America. "If you do believe that content is king, it's rather unfortunate that so many of the content providers have put themselves in a position where they're held hostage to the on-line services."

The Encyclopedia Britannica had an earlier experiment with on-line information delivery via the Mead Data Corporation but the agreement ended in 1985 when the two companies could not agree on development costs.

"We're creating a new market for content providers," said Larry Smarr, director of the National Center for Supercomputer Applications, which developed the Mosaic browser software. "Here is a whole world of people who are using cyberspace as their information stream. They are all potential customers for commercial information providers."

BY MICHAEL ROTHSCHILD

Stagecoach Days on the Infohighway

MAYBE I'M THE only one. But every time I hear that now-ubiquitous phrase "information superhighway," my mind spins off in search of meaningful images. Diesel-belching 18-wheelers hauling gigabyte loads. An overturned CD-ROM, its cargo of video images spilt across three lanes of a data freeway. Burly info haulers poppin' pills in the middle of the night to keep on truckin' at the speed of light.

Extrapolating the familiar present to imagine a radically different future has never worked. What predictive power resided in phrases like iron horse, horseless carriage, wireless telegraphy or picture radio? Did they offer any hint of what life would be like once the innovation took hold? By their very nature, technological revolutions sever society's links to its immediate past.

Today, phrases like information superhighway and 500-channel tv blind us to the most potent and profitable aspects of the dawning Information Age. Superhighways and television are pivotal to today's systems of mass production and mass communication, but they have nothing in common with the point-to-point, individual-to-individual marketplace that will sprout up around a dense webwork of fiber optics and computers.

Instead of extrapolating the present, we can get a better feel for what lies ahead by examining a similar shift that began in the 17th century. Then as now, the plummeting cost of disseminating information created new markets and utterly transformed society.

In London in 1649 a fellow named Henry Walker got his hands on an idle

Diesel-belching 18-wheelers hauling gigabyte loads? Hardly. We can get a feel for what really lies ahead by examining the shift that began in the 17th century, when the plummeting cost of disseminating information utterly transformed society.

printing press and began printing up what we'd recognize as a weekly newsletter. To promote his registry office, which brought buyers and sellers together, Walker ran his own ad to attract business from those who "have household stuff to sell, also others that would lay jewels to pawn, gentlemen that want servants and servants that want places. For any business it [costs] but fourpence and doth much good in bringing the buyer and seller together."

MARKET = BUYERS + SELLERS

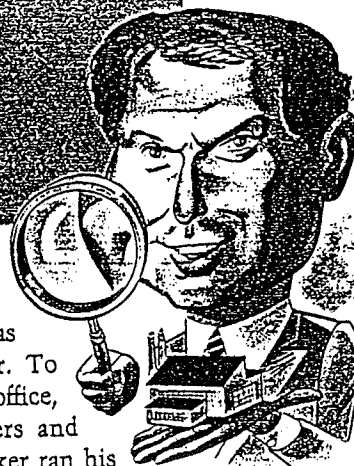
Every market depends on buyers and sellers being aware of each other.

Before Walker and his competitors began printing these "classified ad" sheets—the predecessors of modern newspapers—buyers and sellers had no easy way of finding each other. The likelihood of a mutually profitable exchange was limited by who happened to bring what to the village market on a given day. Sky-high information costs choked off most potential trades before they began.

Advances in printing technology gradually drove costs down while raising page counts and the number of copies printed of each issue. In the early 1800s Koenig cylinder printing and the steam press brought printing speeds up to 1,000 sheets per hour, far exceeding the 150-copies-per-hour rate of handpresses. Later, the railroads and 18,000-pages-per-hour rotary presses combined to further broaden newspaper distribution. Markets for labor and goods

became defined by a newspaper's circulation area instead of the boundaries of a village square.

Much as people buy today's computer magazines, people bought newspapers primarily to study the ads. In America the editorial content of newspapers remained secondary to the advertising right up until the Civil War, when harrowing battlefield reports transformed newspapers by



increasing circulations and shoving ads off the front page.

Illustrated magazines appeared around the turn of this century with advances in linotype typesetting and the invention of halftone technology. Almost all were overstuffed with ads by producers trying to reach a nationwide marketplace. The era of mass communication, paid for by mass advertising, had arrived.

As with newspapers and magazines, the success of radio hinged upon its value as an advertising medium. Not everyone saw it that way, of course. General David Sarnoff, head of RCA, spoke out vigorously against the commercialization of radio. And in 1922 secretary of commerce Herbert Hoover argued that it was "inconceivable...to allow so great a possibility for service...to be drowned in advertising chatter." Needless to say, the technologists and government officials lost out to market forces.

Virtually all the radio shows of the 1920s and 1930s were controlled by advertising sponsors. "Amos 'n' Andy," radio's most popular show, was brought to radio by Pepsodent's ad agency. To an extent that would embarrass even the producers of today's toy-pushing Saturday morning cartoons, radio shows existed solely to sell products. Sponsors had the final word on everything that went over the air. In 1933, when New York's Radio City was completed, every studio had a "sponsor's booth."

Magazine, radio and television advertising all wield enormous influence over mass audiences, but none of them can compete with newspapers in their original market—classified ads. For centuries newspapers have remained unchallenged in their ability to create local markets in jobs, goods and services by printing want ads at modest rates. To this day the classifieds represent a third of all newspaper revenues.

Despite tv's power, you can't browse through a tv broadcast. Because tv doesn't allow you to zero in on a piece of information when you're ready to look, it simply cannot create the kind of person-to-person marketplace that newspapers made possible centuries

ago. All that is about to change.

Dirt-cheap distribution of text and video from any point on the network to any other means that a vast new marketplace will open up for smaller-scale, intermittent advertisers. Just as cheap printing presses allowed Henry Walker and his colleagues to create a "virtual" bulletin board for London, the infoweb will allow a coming gener-

The greatest social value of Internet will be in helping buyers and sellers find each other. (But the technoweenies who helped create Internet fail to see this.)

ation of network publishers to create a marketplace for the world.

Ironically, many of the technoweenies who helped create the Internet fail to see that its greatest social value will be in helping buyers and sellers find each other. Instead, echoing that great visionary Herbert Hoover, they rail against advertising, fearing crass commercialization of a technology too important to be used for making money.

More savvy observers like Christopher Locke, former editor of *Internet Business Report* and now general manager, Internet group, for Mecklemedia Corp., Westport, Conn., recognize that "as the Internet comes to depend more on business involvement and less on government largess, some form of business advantage is critical if companies are expected to put money into developing the medium." That doesn't mean, however, that mass advertising will find its way into the on-line world. "When Prodigy tried putting advertising on line," says Locke, "it brought howls of protest from users unwilling to share precious screen real estate

with digitized billboards."

"The rules are completely different in the new environment," claims John Duhring of WAIS Inc., an Internet information services provider based in Menlo Park, Calif. "We don't realize just how we've organized ourselves around the economics of print, radio and tv." Until now, advertisers have had to squeeze value from tiny bits of space or airtime. Duhring contends that "space and time limitations are meaningless on the Internet. Full technical information, not just grabby pictures and headlines, can be included in ads." In a world where more and more products are pure information, it'll be hard to tell where the advertising ends and the product begins.

Duhring's views are echoed by Tim O'Reilly, whose company offers another new information service called the Global Network Navigator. O'Reilly says that unlike the "in your face" advertising common today, ads on the infoweb will help people retrieve the information they want, entirely under their own control. "We're working with advertisers to create resource centers consisting of useful information about their products. Readers can simply browse the marketplace."

ENDLESS ON-LINE WANT ADS

The future sounds a lot more like a video version of your newspaper's classified pages than a 500-channel dose of prime time. Instead of intrusive, often obnoxious, mass advertising, we'll see an endless on-line video want-ad system. Ads purchased by everyone from geotechnical consultants and sellers of aircraft parts to buyers of Ming dynasty artifacts will be on display for those who want to survey the market.

Despite what you hear today, life on the infoweb won't be like driving along an information superhighway or sitting stupefied before 500-channel tv. The future beckons with a vast electronic bulletin board. The advertising it carries will do for individuals and small businesses across America what the first newspapers did for buyers and sellers scattered across London: It will create a market that brings them together and makes them rich. 